

REMARKS

This Response and Amendment is filed in reply to the Written Opinion dated December 14, 2004. By this Amendment, claims 1, 8, and 11 are amended, leaving claims 2-7, 9, 10, and 12-19 unchanged.

In Section VII of the Written Opinion, the Examiner objects to a defect identified in line 4 of claim 1. The Applicant has previously corrected this defect in the Amendment under Article 19, filed on February 11, 2005.

In Section V(2) of the Written Opinion, claim 1 is objected to as lacking novelty under PCT Article 33(2) in view of United States Patent Number 3,447,652 issued to Tipton. Also in Section V(2) of the Written Opinion, claims 2-7 are objected to as lacking inventive step under PCT Article 33(3) over Tipton in view of EP 376,239 A2 in the name of Schaufenberg.

Claim 1 is hereby amended, and calls for:

A telescoping sub assembly adapted to be coupled between a drill head of a drilling rig and a drill rod, the telescoping sub assembly comprising:

- a stator portion coupled to the drill rod and defining a drilling axis;
- a rotor portion coupled to the drill head and moveable with respect to the stator portion between a retracted position corresponding to a first drilling depth, and an extended position corresponding to a second drilling depth; and

- a locking assembly releasably engaging the stator portion with the rotor portion in an extended state of the telescoping sub assembly via a first mating engagement between the rotor and stator portions in a first relative axial position of the rotor portion with respect to the stator portion; and

- the locking assembly releasably engaging the stator portion with the rotor portion in a retracted state of the telescoping sub assembly via a second mating engagement between the rotor and stator portions in a second relative axial position of the rotor portion with respect to the stator portion;

- wherein the stator and rotor portions are releasably engaged with one another at the first and second axial locations by relative rotational movement of the rotor portion with respect to the stator portion at the first and second axial locations, respectively, and wherein such engagement of the stator and rotor portions prohibits further relative rotation of the rotor portion with respect to the stator portion.

As described in greater detail in the present application as originally filed, some embodiments of the present invention provide a telescoping sub assembly having a stator portion, a rotor portion movable between retracted and extended positions corresponding to different drilling depths, and a locking assembly providing first and second mating engagements between the rotor and stator portions at different axial locations, whereby the rotor and stator portions are releasably engaged with each other at such locations by relative rotational movement of the rotor.

In contrast, Tipton discloses a telescoping drilling device in which alternately stacked force transmitting rings (64) and resilient rings (66) are located in an annular space between an inner drill pipe (26) and an outer drill pipe (22). Rather than generating engagement by rotation as claimed in amended claim 1, hydraulic fluid is used as described in column 4, from line 13 to line 72 to compress the resilient rings, causing significant radial displacement to fill the annular space between the inner and outer drill pipes. This radial expansion causes engagement between the inner and outer drill pipes. The frictional holding force of the resilient rings secures the drill pipes from relative axial movement. The engagement components and manner of engagement in the Tipton device is significantly different from that of the telescoping sub assembly claimed in amended claim 1. Also, the Applicant respectfully submits that Tipton fails to suggest the desirability of the engagement components and manner of engagement between the rotor and stator portions as claimed in amended claim 1.

Claims 2-7 are each ultimately dependent upon amended claim 1, and are allowable based upon amended claim 1 and upon other features and elements claimed in claims 2-7 but not discussed herein. Accordingly, and for other reasons not discussed herein, the Applicant respectfully requests withdrawal of the PCT Article 33(2) objections of amended claim 1, and the PCT Article 33(3) objections of claims 2-7.

In Section V(2) of the Written Opinion, claims 8-10 are objected to under PCT Article 33(3) as being obvious over Tipton in view of Schaufenbe.

Claim 8 is hereby amended, and calls for:

A telescoping sub assembly adapted to be coupled between a drill head of a drilling rig and a drill rod, the telescoping sub assembly comprising:

- a generally cylindrical stator housing defining a drilling axis;
- a bottom sub coupled to an end of the stator housing and adapted to be coupled to the drill rod;
- a generally cylindrical guide member coupled to an opposite end of the stator housing;
- a rotor shaft having a first end adapted to be coupled to the drill head, and a second end that is received by the guide member and the stator housing, the rotor shaft moveable with respect to the guide member between a retracted position corresponding to a first drilling depth and an extended position corresponding to a second drilling depth;
- a locking plate coupled to the stator housing and providing a first engagement portion adjacent the bottom sub and a second engagement portion adjacent the guide member; and
- a drive dog coupled to the second end of the rotor shaft, the drive dog engaging the first engagement portion when the rotor shaft is in the retracted position by rotational movement of the drive dog with respect to the first engagement portion and engaging the second engagement portion when the rotor shaft is in the extended position by rotational movement of the drive dog with respect to the second engagement portion, engagement between the drive dog and the first and second engagement portions transmitting rotational movement from the rotor shaft to the stator housing.

As described in greater detail in the present application as originally filed, some embodiments of the present invention provide a telescoping sub assembly having a generally cylindrical stator housing and a rotor shaft, wherein the telescoping sub assembly is operable in retracted and extended positions, and whereby a drive dog coupled to a rotor shaft engages and disengages different portions of a locking plate corresponding to retracted and extended positions of the rotor shaft, and is engagable with the locking plate by rotational movement of the drive dog with respect to such portions of the locking plate.

In contrast, and as discussed above, Tipton discloses a telescoping drilling device in which alternately stacked force transmitting rings (64) and resilient rings (66) are located in an annular space between an inner drill pipe (26) and an outer drill pipe (22). Rather than generating engagement between a drive dog and a locking plate via rotational movement as claimed in amended claim 8, hydraulic fluid is used as described in column

4, from line 13 to line 72 to compress the resilient rings, causing significant radial displacement to fill the annular space between the inner and outer drill pipes. This radial expansion causes engagement between the inner and outer drill pipes. The frictional holding force of the resilient rings secures the drill pipes from relative axial movement. The engagement components and manner of engagement in the Tipton device is significantly different from that of the telescoping sub assembly claimed in amended claim 8. Also, the Applicant respectfully submits that Tipton fails to suggest the desirability of the engagement components and manner of engagement between the drive dog and the locking plate as claimed in amended claim 8.

Schaufenberg fails to cure the deficiencies of Tipton. Schaufenberg appears to disclose a telescoping drilling rod including a hollow rod (1) and an inner rod (2) engaged with each other by a mating rib structure. The device appears to be continuously in an engaged state from the retracted state to the extended state during drilling. The telescoping drilling rod of Schaufenberg fails to teach, describe, or suggest any structure reasonably comparable to the locking plate, first and second engagement portions of the locking plate (adjacent a bottom sub and a guide member, respectively) and a drive dog engagable with the engagement portions of the locking plate via rotational movement as claimed in amended claim 8. The Applicant also respectfully submits that Schaufenberg fails to suggest the desirability of the engagement components and manner of engagement between a locking plate and a drive dog as claimed in amended claim 8.

Claims 9 and 10 are each dependent upon independent claim 8, and are allowable based upon amended claim 8 and upon other features and elements claimed in claims 9 and 10 but not discussed herein. Accordingly, and for other reasons not discussed herein, the Applicant respectfully requests withdrawal of the PCT Article 33(3) objections of amended claim 8 and claims 9 and 10.

In Section V(2) of the Written Opinion, claims 11-13, 15, and 16 are objected to under PCT Article 33(2) as being anticipated by Tipton. Also in Section V(2) of the Written Opinion, claims 17-19 are objected to under PCT Article 33(3) as being obvious over Tipton in view of Schaufenberg. Claim 14 is objected to under PCT Article 33(3) as

being obvious over Tipton and Schaufenbe in further view of United States Patent Number 4,196,781 issued to Cheek.

Claim 11 is hereby amended, and calls for:

A method for drilling a hole in the ground with a drilling rig, the drilling rig including a tower and a drill head that is moveable along the tower, the method comprising:

- providing a telescoping sub assembly including a rotor portion and a stator portion, the sub assembly being adjustable between a retracted configuration and an extended configuration;
- coupling one end of the telescoping sub to the drill head;
- coupling an opposite end of the telescoping sub to a drill rod, thereby defining a drill string;
- operating the drilling rig to drill to a first depth;
- upon reaching the first depth, operating the drilling rig to adjust the telescoping sub assembly from the retracted configuration to the extended configuration, including rotating the rotor portion with respect to the stator portion to disengage the rotor portion from the stator portion and rotating the rotor portion with respect to the stator portion to re-engage the rotor portion with the stator portion at a different relative axial position of the rotor portion with respect to the stator portion; and
- with the telescoping sub assembly in the extended configuration, operating the drilling rig to drill to a second depth that is greater than the first depth.

As described in greater detail in the present application as originally filed, some embodiments of the present invention provide method for drilling a hole in the ground with a drilling rig, wherein the drilling rig is operated to a first depth, the telescoping sub assembly is extended from a retracted configuration to an extended configuration, and the drilling rig is operated to a second depth, and wherein extending the telescoping sub assembly includes rotating a rotor portion with respect to a stator portion at different relative axial positions to disengage and re-engage the rotor portion with respect to the stator portion.

In contrast, and as discussed above, Tipton discloses a telescoping drilling device in which alternately stacked force transmitting rings (64) and resilient rings (66) are located in an annular space between an inner drill pipe (26) and an outer drill pipe (22). Rather than disengaging and engaging by rotation as claimed in amended claim 11,

hydraulic fluid is used as described in column 4, from line 13 to line 72 to compress the resilient rings, causing significant radial displacement to fill the annular space between the inner and outer drill pipes. This radial expansion causes engagement between the inner and outer drill pipes. The frictional holding force of the resilient rings secures the drill pipes from relative axial movement. The manner of disengagement and engagement in the Tipton device is significantly different from the method claimed in amended claim 11. Also, the Applicant respectfully submits that Tipton fails to suggest the desirability of the manner of disengagement and engagement as claimed in amended claim 11.

Claims 12-19 are each ultimately dependent upon amended claim 11, and are allowable based upon amended claim 11 and upon other features and elements claimed in claims 12-19 but not discussed herein. Accordingly, and for other reasons not discussed herein, the Applicant respectfully requests withdrawal of the PCT Article 33(2) objections of amended claim 11 and claims 12, 13, 15, and 16, and the PCT Article 33(3) objections of claims 14 and 17-19.

In view of the above amendments and remarks, the Applicant respectfully submits that the claims are patentably distinct over the prior art, that all the objections to the claims have been overcome, and that the application is in condition for allowance. Entry of this Amendment is therefore requested. If any issues remain outstanding upon entry of this Amendment, the Examiner is respectfully requested to telephone the undersigned Applicant's Representative at (414) 225-8266.

Respectfully submitted,

BY



Christopher B. Austin
Attorney for Applicant
Registration No. 41,592

Michael Best & Friedrich LLP
100 East Wisconsin Avenue
Milwaukee, WI 53202
414-225-8266